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ABSTRACT

Five articles and two columns reprinted from 1984 and 1985 issues of "The Computing Teacher" address various ethical and legal issues involved in computer use. In "A Question of Ethics," Larry S. Hannah and Charles B. Matus suggest guidelines for dilemma discussion in the classroom to address social and moral issues and to help students to develop reasoning skills. "Computers, Kids and Values," by Stephen J. Taffee, examines several values clarification strategies that focus upon values and moral issues relating to computers or that use computer terms as a means of stimulating discussion of broader issues. Situations for a discussion activity to help students and teachers think about situations and various points of view involving computers are presented in "Ethics and Computer Use" by Kay Gilliland and Mattye Pollard, and David G. Novick answers questions about legal problems with software under the laws of the United States in two copies of his continuing column, "Computers, Software and the Law." In "Right and Wrong in Educational Computing," David G. Novick looks at the interaction of ethics and law in specific situations commonly encountered by computer educators, and Leroy Finkel discusses current interpretations of copyright laws as they affect back-up copies, multiple loading, and networks in "Software Copyright Interpretation." (MES)

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ETHICAL ISSUES IN COMPUTER USE

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A Question of Ethics

by
Larry S. Hannah and Charles B. Matus

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Not all the computer news these days involves announcements of new technological breakthroughs, machines, or even new software. Recent headlines in the News section of *InfoWorld* point out some of the other computer-related issues facing our society.

"Louisiana legislation would punish software pirates" (March 19, 1984, p. 16)

"Apple wins copyright appeal: Australian court bolsters international law" (June 25, 1984, p. 12)

"Quakers condemn violent video games" (April 2, 1984, p. 18)

"Police raid worries sysops: bulletin board shutdown raises debate" (July 9, 1984, p. 30)

"Video arcades meet stiff community opposition" (December 26, 1983/January 2, 1984, p. 18)

Another issue ran as its cover story, *"Preschool computing: are we pushing our kids too hard?"* (February 20, 1984, pp. 24-27)

Each of these items is an indication that the widespread use of microcomputers has brought with it new social and moral issues, issues that must be faced by young people as well as adults. How can we as teachers work with moral and social issues such as these in our classrooms? How can we prepare our students to handle such questions? Following is a discussion that might take place in a classroom where a teacher is working with these issues.

Alicia: *I don't think that Sue should help Tom. After all, he did wait until the last minute to start.*

George: *I go along with Alicia. If Tom had started earlier, he would have been able to debug the program. And if he couldn't, then he didn't understand the algorithm and shouldn't pass anyway.*

Mary: *I disagree. If he turns it in and gets an "F," he won't learn how to do it—which he might if Sue reviews the program with him. It's the end of the year and he won't get to see the corrected program. I think that he probably has learned his lesson about waiting until the last minute. And anyway, that's not the main point. Don't forget that he did write most of the program.*

George: *He may have written most of the program, but the sorting element probably is the key rqutine. If he hasn't learned it or can't figure it out, that's his problem, not Sue's. It's his assignment.*

Harley: *To heck with the program. Either she's Tom's friend or she's not. If she's a friend, she'll help. If she isn't, she won't. It's as simple as that.*

The students' task in this discussion is *not* to reach group consensus on Sue's proper action, but rather to examine the moral and social consequences of different courses of action that Sue might take. Each student is encouraged to think about and express possible actions focusing on the reasoning behind the choices. This is the dilemma they are discussing.

THE FINAL PROJECT

"Sue, you're not listening. You have to come over and help me. If I don't get the program finished before tomorrow morning, I'll get an 'F' on the programming project and may not pass the course." Tom was pleading for what he dearly hoped was the last time. If only he hadn't waited until the last night to get started. "Look, I tried everything, but somehow the darn thing just won't sort properly. I know that it's something small, but I just can't get it to work."

After listening to more reasons why Sue felt she shouldn't help him, Tom tried again. "I know that it may seem like cheating, but it's really not. It has to be some silly little error. I've done all of the important work myself. Besides, the whole idea is to learn and I'll be learning how to do it. I'm not asking you to write the whole program, just to find the bug. You're supposed to be a friend. What kind of friend are you if you won't help out when I really need it?"

Should Sue help Tom? ☐ *Yes* ☐ *No*

Why or why not?

Is it a friend's duty to help even if that help might be considered cheating?

Is it fair of Tom to request Sue's help on his project? Why or why not?

What would you advise Sue to do in this situation? Explain.

Background

The strategy for cognitive development of moral and social reasoning as discussed in this article is based largely on the work of Professor Lawrence Kohlberg of Harvard University. A dilemma such as "The Final Project" depicts an issue or situation in which at least two alternative courses of action are available, neither of which clearly represents a socially determined or approved response.

As students participate in a discussion group, they have an opportunity to practice reasoning and decision-making skills. The student may examine consequences of various responses within the relative "safety" of the group. The focused discussion provides a structured opportunity to reach and test tentative conclusions as well as to be exposed to the ideas of others, an experience which enhances the development of complex reasoning skills.

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Dilemmas are designed to present situations relating to course content, current social issues, or the lives of the students in which the central character has to decide between alternative possibilities for action on a moral or social issue. Discussion is to focus on what the central character(s) *should* do and *reasons* supporting that action, not on what the character would do or what the student would or would not do. Probe questions are used to elicit student responses that include both a recommended course of action and a reason for that action.

Extensive research by Dr. Kohlberg and others has demonstrated that during structured, yet open, discussions of dilemma situations, students benefit from examining their own reasoning and that of other participants. Through interaction during discussion of these dilemmas, people naturally move toward more complex, broader reasoning. While Kohlberg bases moral education on universal principles of justice, there is no preaching a set of "appropriate" virtues. The method is based on the concepts that morality develops in stages and that everyone passes through the same stages of moral development. The discussion group provides the necessary interaction to enable growth to occur.

Using Dilemmas in the Classroom

Dilemma discussions may be used at any grade level—however, one must account for varying levels of sophistication in reasoning. Vocabulary, topic selection and time allotment will vary with age and grade level. The younger the group, the more similar reasoning will be; as age advances, so do the variety and complexity of responses to dilemma situations.

"The students' task ... is not to reach group consensus, but rather to examine the moral and social consequences of different courses of action.... Each student is encouraged to think about and express possible actions focusing on the reasoning behind the choices."

The following guidelines will lead to an active, productive dilemma discussion.

- Establish a nonthreatening atmosphere where students feel free to express their opinions and are not intimidated when their ideas are challenged by others.
- Present the dilemma clearly by reading it to the class. Ask the class to verbally reconstruct the dilemma. This serves as a reinforcement and summary of the major components in the dilemma.
- Encourage student interaction and avoid the tendency to respond with your own opinions. Any early expression of teacher ideas can influence the reasoning of some students or keep them from freely expressing contrary viewpoints.
- The discussion begins after you ask the initial probe question. Respond to a rationale-supported response by accepting it non-judgmentally. When a student gives an unsupported response, you must probe for the rationale before accepting the answer. If you do not understand a student's response, seek clarification before accepting or probing further.

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- Keep the discussion flowing by intervening with appropriate questions. Be careful not to dominate the discussion with too many questions, and do not allow any one student or small group to dominate.
- Keep the discussion open-ended. The conversation should focus on the *reasons* used to justify recommended actions relating to the issues in the dilemma—not on the actions themselves. Focusing on the reasoning helps to emphasize the point that there are no inherent right or wrong answers. Do not attempt to force the class to reach agreement on an answer or solution to the dilemma.
- A few minutes before you are scheduled to stop, or when it appears that the group has exhausted the subject, bring the discussion to a close. A non-judgmental summary of the viewpoints expressed during the discussion is very helpful and vital in leaving the group with a sense of accomplishment. It also serves to clarify the various positions expressed by students. You may wish to have them summarize points raised by others, or ask the students to continue the discussion with their parents/family after providing a copy of the dilemma and questions to take home. You also may use the discussion as a lead-in for other activities, e.g., creative writing, analysis of historically similar situations, etc.
- It is important that you express your appreciation to the group for their efforts, cooperation and accomplishments.

Here are three additional dilemmas for your use, followed by a general discussion of the dilemmas which place them in a classroom context. The probe questions at the end of each dilemma are used to regenerate a discussion that has begun to stall or become one-sided. The intent is not to seek a specific response or force a position, but rather to challenge students' thinking and require them to re-examine their position(s) based upon additional data. There is no magic involved in conducting moral dilemma discussions—just follow the guidelines given, keep the discussion open and focus on reasons. Students and teachers who have been involved in discussions on dilemmas such as these have found them to be exciting, informative and productive.

WHAT'S THE HARM?

"What's wrong, Sue? You look as though something is bothering you."

"Jim, do you know what Bill, Mary and the others are doing in the computer lab? They were scanning the Keymakers' Bulletin Board and found the telephone number and access code of the Security Credit Bureau. I thought it was funny when they called the credit bureau and found out that the principal was three months behind on his car payments. But then, somehow, it didn't seem right. They're checking on Mrs. Henderson, our English teacher, right now. Did you know that they can find out how much anyone owes on their credit cards, house, car, anything? . . . I know that they don't plan to do anything special with the information, but it just doesn't seem right."

"Well," Jim asked, "what do you plan to do? You know that if you tell any of the teachers about it, we'll just get banned from using the lab after school. You remember that Mrs. Roberts warned us about calling that bulletin board last week. Did you try to get them to stop?"

"Yes, but they think that it's just a game. They won't quit. I really think that I should tell Mrs. Roberts, but you're right. They will start closing the lab after school and the group will blame me. I don't know what to do."

Should Sue report the group? ☐ *Yes* ☐ *No*

Why or why not?

Is it actually right or wrong for Bill, Mary and the others to be getting credit information on people using the computer access code from the Security Credit Bureau? Explain.

If Sue told Mrs. Roberts about the group's activities, would it be fair for Mrs. Roberts to close the computer lab to all students after school? Why or why not?

Should Sue's decision to tell or not to tell be affected by her classmates' feelings toward her? Explain your answer.

If the majority of students agree that Sue should tell, then probe further with:

Would it change the situation if Sue knew that the students accessing the Credit Bureau would be suspended from school if their activities were discovered? Explain.

If the majority of the class agrees that Sue should not tell, then probe further with:

Would it change the situation if the students accessing the Credit Bureau records started to gossip about the information they were obtaining, and even started getting information on the parents of students in the school? Explain your answer.

If you were Sue, what would you do? Explain.

WRITE OR WRONG

Ms. Garcia, the school principal, was preparing for a discussion on the district's interim word processing policy with the faculty. She had been told by her supervisor to reaffirm the interim policy stating that "no major assignments are to be done with the aid of microcomputer word processing programs." Ms. Garcia also was aware that the policy was controversial with faculty members, students and parents. Already, one student had refused to comply with the policy and had received a failing grade on a term paper written on a word processor. The student was challenging the policy and had appealed to Ms. Garcia.

Ms. Garcia knew it was her duty as principal to enforce the interim policy even though she was personally undecided about its fairness. She felt badly that a student at her school was getting an "F" based on a policy that even the school board had declared as "interim" while they studied the issue further.

Should Ms. Garcia enforce the policy? Why? Why not?

Is the policy fair to everyone? Should students who have a computer at home have an advantage over those who do not? Explain.

Is the student who received an "F" right in challenging the policy? Explain.

If the majority of the class agrees that Ms. Garcia should not enforce the policy, probe further by modifying the dilemma as follows:

Would it change the situation if Ms. Garcia knew that nonenforcement of the policy would lead to a protest by several students and parents? They already had argued that allowing one student's violation of school policy to go unpunished is unfair to those who had complied and not used word processing. Explain.

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QUEST FOR THE WIZARD

"WOW! You got ***Quest for the Wizard****! How did you ever get that? I've got to get a copy." Indeed, Scott had finally gotten a copy of the game he and everyone else wanted, but it wasn't his to keep. A friend at Software City had felt sorry for him after seeing Scott longingly try out the program for the third Saturday in a row. As a favor, he loaned Scott the store's demonstration copy to play with over the weekend.*

"Jerry at the computer store let me borrow it. I had to promise him that I wouldn't make a copy for myself. Sorry, Manny, we can't do that."

"Hey, look, you're not going to hold out on me now, are you? Where do you think you got all your games? You certainly didn't buy them. Without me, you would still be sitting there writing your BASIC programs. Tell you what. You let me make a copy for myself, and then you won't be breaking your promise to Jerry. Then, a few days from now, I'll make a copy for you. Remember, you owe me a lot more than you owe Jerry."

Should Scott make the copy for Manny? ☐ *Yes* ☐ *No*

Is it Scott's duty to keep his word to Jerry (the software salesperson) and not make himself a copy? Why?

Would it actually be wrong for Scott to let Manny make a copy for himself? Explain your answer.

Does the fact that Manny has shared many programs with Scott obligate Scott to share this program with Manny? Why or why not?

Is Manny being fair in demanding that Scott let him make a copy of ***Quest for the Wizard****? Explain your answer.*

If the majority of the discussion group agrees that Scott should make a copy of ***Quest for the Wizard*** *for Manny, then probe further with:*

Would it matter if Jerry found out and told Scott that he was no longer welcome in the store because he had broken his promise? Explain your answer.

If the majority of the discussion group agrees that Scott should not make a copy of ***Quest for the Wizard*** *for Manny, then probe further with:*

Would it matter if Manny told Scott that he would stop sharing his programs if Scott did not share ***Quest for the Wizard*** *and, furthermore, he did not think he was much of a friend if he would not let him make the copy? Explain your answer.*

Each dilemma presented addresses one or more social and moral issues. In "The Final Project" students are asked to examine the concepts of friendship, obligations, honesty and fairness as they relate to the dilemma of whether or not to help a friend on a school assignment.

"What's the Harm?" illustrates a couple of basic points concerning the use and structure of dilemmas in the classroom. **Real-world, topical issues can be used to stimulate interest and debate.** The dilemma is based on a news story that broke on June 20, 1984. In this case, unauthorized individuals used home computers to access TRW Information Services, a credit data bank with information on over 90 million persons. The access was made using a phone number and access code listed on a computerized bulletin board. The only other information required was the name and address of the person on whom they were seeking information. *(The Sacramento Bee,* 6/21/84)

Although the dilemma focuses on a computer-based topic, students are asked to reason around age-old questions regarding friendship and responsibility to a group versus responding to an ideal. A direct focus on whether or not one should make unauthorized entrance into a data bank is too easily responded to with a "no" answer. Topics which have obvious "right" or "wrong" answers do not lead to productive debate. In the course of the debate on whether Sue should or should not report her friends, much information will be shared on information services, data banks in general, data security, modems, bulletin boards, etc. The debate on the dilemma topic can be followed by a valuable discussion of these related topics and others such as the issue of privacy.

"Quest for the Wizard" requires discussion participants to examine their beliefs in a situation which tests personal and professional ethics. Scott is caught between keeping a promise and sharing with a friend. The issue is further complicated by the potential violation of copyright laws. Scott is tempted by a devious request to violate his promise and is reminded that he has not refused programs in the past that were reproduced in violation of copyright. These are complex issues with which to wrestle, but ones that are commonly faced and responded to without a great deal of thought.

Often during the course of a dilemma discussion such as with "Write or Wrong," participants will want to "solve" the dilemma. They may respond to probe questions by requesting more details or by proposing solutions. When this happens, be aware that the discussion could easily slip into a problem-solving exercise unless you refocus the discussion on the moral issues involved. If you repeatedly find it necessary to refocus on the issues, remind the group of the distinction between solving a problem and examining the issues.

When a dilemma discussion has been exhausted and there is a desire to pursue the topic further from another approach, it is entirely appropriate to shift to problem solving. The objective then is to achieve a solution or solutions which are fair and just. If a true dilemma has been presented, problem solving may be quite difficult and no universally acceptable solution may be found. This, of course, leads to other issues such as the political process of compromise and its inherent ethical and moral implications.

Summary

During the course of each day, young people are faced with a number of decisions requiring social and moral reasoning. These decisions frequently are made without sufficient data, an awareness of alternatives or an understanding of the possible consequences associated with a given course of action. Through the use of dilemma discussions, students are provided the opportunity to examine their beliefs about personal morals and social ethics, and to develop an intrinsic sense of personal and social responsibility without having a set of predetermined virtues thrust upon them.

As educators, we can influence the future by providing young people the opportunity to polish their reasoning skills, to develop fairer and more just positions regarding social and moral issues. The use of the open-ended, moral dilemma discussion is a way of developing cognitive skills that are in keeping with the inherent democratic principles of fairness and justice. **END**■

[For a further discussion of Lawrence Kohlberg's theory of moral reasoning and instructions on writing and using dilemmas, see Ronald E. Galbraith and Thomas M. Jones, Moral Reasoning: A Teaching Handbook for Adapting Kohlberg to the Classroom. *Minneapolis, MN: Greenhaven Press Inc., 1976. Dilemmas in this article may be reproduced for classroom use.]*

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Computers, Kids and Values

by
Stephen J. Taffee

Introduction

The computer revolution has brought with it a host of related ethical and moral concerns which have been given little more than lip service by educators. These concerns include privacy issues, equality of computing opportunity, violence and stereotyping of characters in computer games and computer crime. There are reports of students becoming engrossed in computers at the expense of their relationships with others and/or their school work. Educators wanting to address these concerns find their efforts confounded by a lack of legal certainty about hardware and software copyrights and patents; the availability of sophisticated copy programs and hardware designed to reproduce even copy-protected software; software rental agencies (which allegedly contribute to illegal copying); the hero image accorded computer "hackers" (a la *War Games*) who make unauthorized entry into computer systems; and a great deal of confusion and conflict in society at large about the appropriate place for computers in our daily lives.

While answers to what is "right" or "wrong," "good" or "bad" about computers may be elusive, a means for making such judgments is not. Educators have been using values clarification for many years to help students acquire more meaningful, socially constructive guides to decision making. While this process and technique is widely known (Raths, Simon and Harmin, 1978; Simon, Howe and Kirschenbaum, 1972; Simon and Clark, 1975), values clarification has seldom been applied to computer-related issues.

Values Clarification

Values clarification is a process for helping students make better informed decisions about values and moral issues. It is neither morally absolute nor morally relativistic ("everything goes"). Instead, it requires that students reflect on available value choices, the consequences of each choice, how they act on their values and how they feel about their values. Students are encouraged to develop the interpersonal communications skills necessary to explore such issues with each other in meaningful ways. Teachers, through the use of carefully constructed values clarification exercises and class discussion, can help students wrestle with many important issues involving computers, without lecturing and nagging on the one hand, or simply avoiding the subject, hoping students will somehow work it out on their own.

Here are several values clarification strategies which focus upon values and moral issues concerning computers or which use computer terms as a means of stimulating discussion of broader issues. Remember—each strategy is meant as a stimulus for discussion and is not an end in itself. Clarification of values occurs when students have an opportunity to reflect and to share their thoughts and feelings over a period of time. Teachers must guard against their own as well as students' moralizing and try to keep the class free from pronouncements of right and wrong which can end class participation prematurely.

The new user of values clarification strategies is strongly encouraged to read one of the many introductions to the use of the technique which are available (see References). While the techniques are not difficult to use, it is important that they be used in a manner which will reduce the tendency to moralize or otherwise influence students to respond in ways which they believe would be acceptable to their teacher. Teachers are encouraged to share their own responses to any of these strategies with their students, but it is best done toward the end of class so as not to unduly influence students.

Strategies About Computers

Strategy #1—Values Continuum

One of the mainstays of values clarification, the values continuum, encourages students to see that values often are not absolute, and that there can be a wide range of opinions on a given topic.

Directions: Explain the extremes represented by each end of the continuas in figures 1 and 2, and ask students to consider where their values fall on those continua. The strategy may be processed using any of the outlined discussion techniques.

In figure 1, "Lock-It Louise" believes that all software should be extensively copy-protected and that violators should be prosecuted to the full extent of the law. Copy programs and devices, and software rental enterprises would be outlawed. "Copy-Kate," on the other hand, would do away with all copy-protection schemes, and would support legislation to allow all software to be listed and modified as the user sees fit. In the meantime, the copying of software is seen as a perfectly legitimate alternative.

In figure 2, Gaming Gabe is a computer game freak who defines computers as "toys" and is only interested in using computers for fun. Serious Cyril sees computers as "tools" and takes a work-oriented approach to them. Cyril is interested in computers to the extent that they can make his life more productive and profitable.

Figure 1.
Software protection continuum.

Figure 2.
Purpose of computers continuum.

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Discussion: The continuum strategy may be processed in several ways.

1. Designate ends of the classroom as ends of the continuum and ask students to walk to the part of the room which best represents their position on the continuum. Once there, they may discuss their choices and reasoning with nearby students and adjust their position if necessary.
2. You can draw a continuum on a chalkboard or overhead transparency and ask several students to write their name on the continuum at the spot representing their position. A class discussion can follow.
3. You may keep this activity (and any of those which follow) at a more "private" level and encourage students to interact with each other in small groups or to write about their experiences in a journal.

Strategy #2—Rank Order

In this strategy, students are asked to prioritize a list of alternatives. The choices may be constructed to be mostly attractive or unattractive (thus making choosing more difficult), or neutral to encourage a range of opinion.

Directions: Explain to students that they are to rank order the following classes of programs. (Some may need to have the meaning of rank order explained to them.) Students are to place the number 1 next to the type of program most important to them, a 2 next to the next most important, and so on.

_____ Arcade-type games
_____ Communications utilities
_____ Copy utilities
_____ Educational games/drills/tutorials
_____ Fantasy games
_____ Graphics/drawing (including Logo)
_____ Programming utilities
_____ Spreadsheets
_____ Word processing

Discussion: The activity may be processed by asking students to share their rank orders with the rest of the class or a small group. Students may also make private journal entries.

Rank orders may also be applied to situations involving people. For example, teachers could read the following anecdote to their class, and ask students to rank order the characters' behavior from most ethical to least ethical:

> Mary recently was given a new computer system for her birthday. Prior to that, she was very interested in computers, but mostly because her friend, Brad, was president of the school's computer club. Mary would like to join the school's club, both to learn more about her computer and to be closer to Brad. However, the club has an unofficial initiation requirement that one "pirated" program be submitted to the club's software library by every new member. Brad tells Mary that if she wants to join, she needs to provide the group with a copy of *Martian Mania* (a copy-protected game that came with her new computer). Mary refuses, telling Brad that to do so would be wrong, and even if she wanted to she wouldn't know how to copy it. Another club member, Ann, tells Mary that she could borrow any one of her nibble copying programs or even use her "duplicard"—a hardware device for copying protected software. Disgusted with both Brad and Ann, Mary secretly lets the club's advisor know about the pirating and illegal software library. The advisor subsequently disciplines Brad and Ann, and erases all the club's illegal programs.

Rank the behaviors of the following persons or groups from most ethical to least ethical:

Ann
Brad
Club Advisor
Duplicard, Inc. (manufacturers of software and hardware copying devices)
Martian Mania's producers
Mary

A discussion—quite likely a lively one—can follow. Be sure to insist that students respect each other's right to an opinion and try to keep the discussion focused on what the characters did or should have done. You can also ask students to consider the ethics of the situation from a perspective other than their own, e.g., the school, the publisher of copy-protected software, the makers of copy-protection breaking devices or a judge.

Strategy #3—Either/Or

This strategy forces students to consider how they perceive the computer, often with very interesting and insightful reasoning. (See Strategy #8 for an example of either/or statements which ask students to make judgments on a more personal level.)

Directions: Ask students to respond to the following statements. Discussion may follow the techniques suggested in Strategy #2—Rank Order.

Which is a computer more like?
—Friend or foe?
—Hard or soft?
—Threat or savior?
—Male or female?
—Pleasure or pain?
—Puzzle or solution?
—Work or hobby?
—Person or machine?
—Fire or ice?
—Tool or resource?
—Monster or Messiah?

Strategy #4—Values Sheets

Values sheets are among the most adaptable and available of the values clarification strategies. They are reasonably easy to construct and may be processed in a variety of ways.

Directions: Provide students with a short quotation, portion of a magazine or newspaper article, a picture, cartoon or similar "stimulus." They are then to respond to a series of carefully constructed questions which you have prepared. For example, you might distribute the following, well-known quotation from Evans (1979):

> Suppose for a moment that the automobile industry had developed at the same rate as computers. . . . Today you would be able to buy a Rolls-Royce for $2.75, it would do three million miles to the gallon, and it would deliver enough power to drive the Queen Elizabeth II. And if you were interested in miniaturization, you could place half a dozen of them on the head of a pin. (p. 76)

1. What three words best describe your reaction to this quotation?

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2. What would the world be like if progress in automobiles had indeed matched that of the computer industry?
3. What progress would you like to see in computers during the next twenty years?
4. If you had been given a choice twenty years ago between being able to produce a Rolls Royce quality car for $3.00 or an advanced computer, which would you have chosen? What would have been the consequences of your choice?
5. How is your life different because of microcomputers?

The following cartoon could also be used as a discussion starter:

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Potential processing questions might include:

1. What do you think is meant by the term "brain/reality coordination"? What concern is the speaker revealing by this statement?
2. Which would you rather do with a computer: write a letter, solve a problem or play a game? How might you modify the quality and amount of time you spend using a computer?
3. What kind of computer game would you rather play? Pick one quality from each column:

DIFFICULTY	OUTCOME
☐ Computer wins more than 50% of the time.	☐ Enemy (or you) destroyed.
☐ You win more than 50% of the time.	☐ Treasure gained (or lost).
DISPLAY	**INPUT DEVICE**
☐ Lots of animation & color	☐ Joystick or paddles
☐ Lots of text	☐ Keyboard

4. Which would you rather do (or be able to do)?
   - ☐ Play a computer game.
   - ☐ Write (program) a computer game.
   - ☐ Be a character in a computer game (like *Tron*).
   - ☐ Watch an expert play a computer game.

Strategy #5—Inventory

Computers and technology enter our lives in hundreds of ways almost every day. Many of us use the world's largest computer network every day (the telephone system) without even thinking of it as computer-driven. Similarly, we receive mail generated by computer mailing lists and buy groceries which are classified and priced by a computer.

Directions: Students are to keep a journal of the number and type of computers and technologically-related devices (e.g. calculators) which they encounter in one week. The activity may be processed individually, in small groups or by the whole class.

Strategy #6—Unfinished Sentences

Like the values sheet, this activity can be spontaneously constructed by a teacher, or suggestions can be elicited from the students themselves. It is an excellent warm-up activity for more in-depth activities, and can remain viable indefinitely if the sentence stems are varied and the strategy itself not overused.

Directions: Students are to complete the following sentence stems. Process the activity through techniques previously identified.

- I wish computers were more _____ and less _____.
- Computers are _____.
- I'd rather work with a computer than _____, but I'd rather _____ than work with a computer.
- Copying programs _____.
- "Hackers" _____.
- The best thing I've ever done on a computer was _____.
- Computers are never _____ but they're always _____.
- Ten years from now, I hope computers _____.

Strategies Which Use Computers

As students become more computer literate, educators will be able to use computers as examples and symbols for other aspects of life. Strategies 7 and 8 make use of the computer as a means of stimulating discussion about a range of values-related issues.

Strategy #7—Ask the Computer

Directions: Tell students that they have been given a rare opportunity to ask questions of the world's largest, fastest and smartest computer. However, they will each be allowed to ask only one question. While the computer is the world's smartest, it is limited and may not be able to answer "impossible" questions such as, "How many stars are in the universe?" Care should be taken, therefore, to construct a question which is both reasonable and personally meaningful to the student.

Students can be encouraged to work alone or in groups. If you wish, you might ask students to write an essay about their question and how it is important to them. Questions can be shared, with a class discussion held on the types of questions asked and which ones a computer could really answer.

This strategy could easily work into an extended discussion pertinent to computer literacy. You might discuss which is more important: asking good questions, providing good answers or having good information. This would provide an excellent opportunity to discuss the limitations of computers and whether "logical" answers are always "right" answers.

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Strategy #8—Either/Or

Which are you more like?

—Dot-matrix printer or a letter-quality printer?
—Timex/Sinclair or a Cray supercomputer?
—Floppy disk or a hard disk?
—RAM or ROM?
—Input or output?
—Bit or a byte?
—Hardware or software?
—BASIC or assembly language?

General Comments and Conclusion

Our knowledge and skills in working with computers are progressing at breathtaking speed. If computers are to become fully integrated into our lives and our society, then concerted efforts must be made to encourage progress concerning the many value-related concerns accompanying the computer revolution. Computers are inherently apolitical, unbiased and unthinking machines, yet they may be used in ways which dehumanize and oppress people, or in ways which personalize and liberate people. Values clarification offers us a mechanism for beginning a dialogue with students about such issues. Like the computer itself, it is not a panacea, but it is an exceptional opportunity and resource. **END**

[Stephen J. Taffee, Associate Professor of Education, North Dakota State University, Fargo, ND 58105.]

[This article will also appear in a forthcoming book, edited by the author, entitled Annual Editions: Computers in Education 84/85. *Dushkin Publishing Group, Inc.]*

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Ethics and Computer Use

by
Kay Gilliland and Mattye Pollard

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A computer is just a piece of equipment. The people who use it have to decide what is right and what is wrong in its use. The issues must be addressed and the controversies discussed. Here is a discussion activity to help participants (students or teachers) think about the situations and the various points of view. Role playing can be used, or the vignettes can simply become starting points for conversation.

Skills:
- Understanding different points of view

Time
- 1-2 class periods

Participants
- Groups of 4

Materials
- 1 copy of a situation for each group. (Some groups may have the same situation depending on the number of participants you have.)
- Name tags for all characters in the situation.

Directions:

Divide the participants into groups of four. Explain to the group that they will consider some situations that might arise related to career decisions. Describe the following steps:

- Each group is given a situation. Each participant is given a slip that states the situation from one person's point of view.
- The group discusses the situation as each participant represents his/her part.
- Participants may want to ask other characters for information and opinions. What advice does each character have to offer? The group should try to come to a consensus on the problem.
- At the end of a designated time, or on the following day, when all groups have finished, reconvene the whole group. One person from each group describes their group's scenario and reports each character's position and the group's resolution.
- After each group's report, or at the conclusion of all group reports, introduce the following questions for discussion:
  - —Are these situations familiar? Which arguments do you find most convincing? Why?
  - —Have you heard some of these arguments in real life?
- There are four situations: Polywog, Pascal Courses, S.A.T. Review and School Board Meeting. Each situation has four characters. Cut apart the information for the four characters.

POLYWOG

Situation One: Polywog **Andy**

You are Andy, a high school student who has several copies of popular computer games including *Polywog*. Your friend Peggy wants a copy of *Polywog* so that she can play the game on her computer at home. Peggy has often given you copies of games she has, so you want to be a good friend and reciprocate by copying *Polywog* for her.

You are discussing this issue with Peggy, Susan and Eric.

Situation One: Polywog **Peggy**

You are Peggy, a high school student who likes to play computer games at home. Your friend, Andy, just received *Polywog*, the hottest new computer game, for his birthday. You would like Andy to make a copy of *Polywog* for you. You've given Andy copies of game programs in the past and think it's only fair that Andy make a copy of *Polywog* for you.

You are discussing this issue with Andy, Susan and Eric.

Situation One: Polywog **Susan**

You are Susan, a high school student who knows Andy from Computer Club. Peggy is your best friend. Peggy is asking Andy to make a copy of the computer game, *Polywog*, for her. You inform them that your mother, a software developer, wrote *Polywog*. You helped her with the graphics for the program. Both of you spent many hours developing and testing *Polywog*. Your mom's income is generated by royalties from the sales of *Polywog*. You feel it is unethical for Andy to copy *Polywog* for Peggy. Your mom would lose lots of money if students made a practice of copying game programs.

You are discussing this issue with Eric, Andy and Peggy.

Situation One: Polywog **Eric**

You are Eric, a high school student who likes to play computer games. Your father is a lawyer. You hear Andy tell Peggy that he will give her a copy of *Polywog*, but Susan is objecting to this. You point out that your teacher doesn't allow copying of software. You remind them that it is illegal to copy software. You suggest that there must be other ways that Andy could arrange for Peggy to use *Polywog* without making a copy for her.

You are discussing this issue with Peggy, Susan and Andy.

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PASCAL COURSES

Situation Two: Pascal Courses — **Ms. Basyk, Computer Teacher**

You are Ms. Basyk, a computer teacher at HiTech High School, and you are scheduled for leave next year. You have taught Pascal for the past three years in a computer lab equipped with ten mirocomputers and three Pascal language systems. Since Pascal is disk-dependent, you have made several additional copies of Pascal so that all ten computers can be used during your classes. You want every student to have as many hands-on Pascal experiences as possible during class time. Mr. Coball, another teacher in the department, will be teaching your class next year, and does not want to use the copied disks.

You are meeting with Ms. Logogh, Mr. Coball and Mr. Toepoe to discuss this issue.

Situation Two: Pascal Courses — **Mr. Coball, Computer Teacher**

You are Mr. Coball, a computer teacher at HiTech High School. Ms. Logogh, the computer department chair, has asked you to teach Pascal next year because Ms. Basyk will be on leave. You are excited about teaching this course since you have only taught the introductory computer courses in the past. However, there is a potential problem which you need to resolve. Ms. Basyk uses several pirated copies of the Pascal language disks in her class. You refuse to use the pirated disks, and have asked Ms. Logogh to purchase more sets of the Pascal language systems for use in next year's class.

You are meeting with Ms. Basyk, Ms. Logogh and Mr. Toepoe to discuss this issue.

Situation Two: Pascal Courses — **Ms. Logogh, Department Chair**

You are Ms. Logogh, the chair of the computer department at HiTech High School. Ms. Basyk, who has taught Pascal at HiTech High for several years, will be on leave next year. Mr. Coball will teach the Pascal class, but has requested that you purchase seven more copies of the Pascal language system. When you asked him why he needs more copies of Pascal, he told you that he believes it's wrong to use the pirated disks which Ms. Basyk has been using in her Pascal course. You have arranged a meeting with these two teachers and Mr. Toepoe, the principal of HiTech High.

You are discussing this issue with Ms. Basyk, Mr. Coball and Mr. Toepoe.

Situation Two: Pascal Courses — **Mr. Toepoe, Principal of HiTech**

You are Mr. Toepoe, principal of HiTech High School. Ms. Logogh, chair of the computer department, has called a meeting to discuss a departmental problem with you. Mr. Coball has asked her to buy several additional copies of the Pascal language system to be used in his class next year. In the past Ms. Basyk has had no trouble teaching Pascal using only three copies of the language system. There isn't enough money in the budget to purchase this additional software. District policy forbids the copying of commercial diskettes.

You are discussing this issue with Ms. Logogh, Ms. Basyk and Mr. Coball.

S.A.T. REVIEW

Situation Three: S.A.T. Review **Mr. Jacobs, Parent**

You are Mr. Jacobs, the father of two children who attend Sunrise High School. Mary is a junior and Todd is a senior. The S.A.T. (Scholastic Aptitude Test) will be given in a month to college-bound juniors and seniors. Both of the Jacobs children are planning on attending college, so they want to review for the S.A.T. by using the review program which can be checked out in the school's media center. Unfortunately, there is only one copy of the *S.A.T. Review* program available. Because of the great demand for this program, each student can use the program only one hour per week. Mr. Jacobs has asked Ms. Dawne to make copies of the program so that several students, including his children, can use the program at the same time.

You are meeting with Ms. Dawne, Ms. Ray and Mr. Byte to try to resolve this issue.

Situation Three: S.A.T. Review **Ms. Dawne, Media Specialist**

You are Ms. Dawne, the media specialist at Sunrise High School. One of your responsibilities is to monitor the use of the five microcomputers located in the media center. Because of the upcoming S.A.T., many students have been requesting the *S.A.T. Review* program. There is only one copy of this program, so each student may use this program for about an hour per week. Yesterday, Mr. Jacobs, a parent, called and asked you to make more copies of the S.A.T. program. You told Mr. Jacobs that it is both illegal and unethical to make pirated copies of commercial software.

You are meeting with Mr. Jacobs, Ms. Ray and Mr. Byte to try to resolve this issue.

Situation Three: S.A.T. Review **Mr. Byte, District Computer Specialist**

You are Mr. Byte, district computer specialist. Ms. Ray, principal of Sunrise High School, has called you to discuss a problem at her school regarding computer software. Mr. Jacobs, the father of two students at Sunrise, has asked Ms. Dawne, the media specialist, to make several copies of the *S.A.T. Review* program. He wants his children to have more time to use this program to prepare for the upcoming S.A.T. Currently, since there is only one copy of the review program in the library, each student is allowed only one hour per week to use the program. You point out that it is illegal to make pirated copies of commercial software. In addition, it violates the district policy on software copyright laws.

You are meeting with Ms. Ray, Mr. Jacobs and Ms. Dawne to discuss this problem.

Situation Three: S.A.T. Review **Ms. Ray, Principal of Sunrise High**

You are Ms. Ray, principal of Sunrise High School. You recently received a call from Mr. Jacobs, a parent of two students who attend Sunrise. He has requested that Ms. Dawne, the media specialist, make several copies of the popular *S.A.T. Review* program so that his children have a greater opportunity to review for the upcoming test. You think that this is a reasonable request since it is important that college-bound students at Sunrise do well on the S.A.T. After all, Sunrise has a fine reputation for preparing students to attend the top universities in the nation. In fact, ten Sunrise students recently qualified as finalists for the prestigious National Merit scholarships.

You have scheduled a meeting with Mr. Jacobs, Ms. Dawne and Mr. Byte in which you are trying to resolve this issue.

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SCHOOL BOARD MEETING

Situation Four: School Board Meeting Superintendent Taylor

You are the School Superintendent, Cynthia Taylor, an appointed official of the School Board. You would like to see the district take a leadership position in the educational use of computers. You plan to present a policy statement to the Board regarding the need to observe the copyright laws and publisher license agreements. You feel that such a statement will enhance the district's image. In addition, you are proposing the development of a unit of study for educating students about the legal, ethical and practical problems caused by copying programs that are not in the public domain.

You are attending the regularly scheduled Board meeting.

Situation Four: School Board Meeting Mr. Johnson

You are Mr. Johnson, the father of Betty, a fifth grade student. You have heard that the school district plans to spend $7,500 on software for its elementary schools. Your fifth grader is very excited about learning to program in Logo, but there are only five computers in the school. You know that software can be copied, so you would rather have the district spend the bulk of the money on the purchase of more computers so there will be enough hardware for frequent student use. You don't think the law is clear on software copying, and you don't see why computer programs should be any different from recordings and videotapes. If you can copy music and motion pictures, why not software?

You have come to the School Board meeting to present your case.

Situation Four: School Board Meeting Ms. Press

You are Ms. Press, owner of a software company. You have developed an excellent program to introduce Logo to elementary students. You spent hundreds of hours developing the program and, for you, the issue of software piracy is straightforward: anyone who copies a computer program is stealing. You stand to lose your livelihood if personal copying and copying by schools reduces your sales, so you want it prevented at all costs. You package your program in shrink-wrap with a prominent warning that the person who breaks the seal agrees to a licensing contract. You provide one backup copy and state that the program must not be copied nor used on more than one machine at a time. You consider this license a legal document and anyone who breaks the contract is acting unethically and illegally.

You have come to the School Board meeting to present your case.

Situation Four: School Board Meeting Bernard Brown

You are Bernard Brown, an elected school board member. You are convinced that teachers can strengthen the curriculum of the elementary schools through the use of computers. You want to see needed hardware and software provided for classroom use. You want to provide the best possible opportunities for students at the least cost. Your campaign was based on a promise of improved curriculum with no increase in spending. You are aware that violations of computer copyright laws and licensing agreements will ultimately result in higher costs and could lessen the incentives for development of good educational software. On the other hand, schools could stretch the money further if copyright agreements were loosely interpreted.

You are attending the regularly scheduled School Board meeting.

The EQUALS in Computer Technology program at the Lawrence Hall of Science, University of California, Berkeley is a staff development program to promote increased access of women and minority students to computer education. EQUALS has used these situations with 150 teachers and other educators, who then have used the activity in classrooms. Educators who have taken part have expressed surprise at the complexity of the issues. They agreed that the subject should be further explored by students and adults. Here are some typical comments:

"Ethics discussion was enlightening . . . actually now more confused than settled, but am thinking about it now."

"It made me aware of some issues I hadn't even considered—such as using disks in more than one computer."

"At what budget level can districts (schools, teachers) afford to maintain an ethical stand? At what cost can we abandon it?"

EQUALS has found it important to help participants clearly delineate each role and to distinguish between times when they are role-playing and times when they are expressing their own opinions. Participants are given name tags corresponding to the characters they are playing and are asked to introduce themselves to the small group using some of the information they were given about the situation. When role-playing is completed, they are asked to remove those name tags and discuss the situation as they perceive it themselves. Under the given circumstances, would they copy or would they not? If they decide not to copy, what alternatives can they offer?

Extensions

There are many other ethical problems presented by the use of computers in our society. Students can create their own vignettes around important questions such as these:

- Issues of Equal Access
  - Who can afford a computer?
  - Toward whom is computer advertising directed?
  - What are the various home uses of a computer?
  - How does having a computer at home affect one's outside relationships?
  - Does everybody need to have the same kind of activities or programs?
- Issues of Information Access
  - Who can find out things from data banks?
  - What information should be allowed to be kept on a data bank?
  - What rules should be developed concerning the use of information in data banks?
  - Is it okay to break into other people's computers? Why? Why not?
- Issues of Employment
  - What new skills will be needed?
  - What skills are less needed?
  - What new jobs are created?
  - What types of jobs might disappear?
  - How can we help people deal with these changes?

Are there changes that ought not to be made even though they are possible?

What would an employer consider in making a choice between using a computer (or computer-controlled robot) and a person for a job?

How might the worker's view be different; how might it be the same?

END■

[Kay Gilliland, Director, EQUALS in Computer Technology, Lawrence Hall of Science, University of California, Berkeley, CA; and Mattye Pollard, Teacher, Mathematics and Computer Science, Cherry Creek Public Schools, Englewood, Colorado. With particular thanks to Lynne Alper, Ruth Cossey, Tim Erickson, Sherry Fraser, Helen Joseph, Nancy Kreinberg, Jean Stenmark and Virginia Thompson. For more information on EQUALS programs, contact: EQUALS, Lawrence Hall of Science, University of California, Berkeley, CA 94720.]

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*[This article will also appear in the **Mathematics Teacher,** Nov. 1984, along with the ICCE Policy Statement on Network and Multiple Machine Software.]*

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Computers, Software and the Law

by
DAVID G. NOVICK

SIGCC is pleased to introduce a continuing column entitled "Computers, Software and the Law," written by attorney David G. Novick. Mr. Novick welcomes your questions regarding legal problems with software under the laws of the United States. Readers' questions will be answered, space permitting. If you have a question about copyright or related topics, please send it to "Computers, Software and the Law," c/o ICCE SIGCC, University of Oregon, 1787 Agate St., Eugene, Oregon 97403, USA.

The answers given in this column are a discussion of general principles of American law, and are intended to provide background information for people who work with computers and software. The author neither purports nor undertakes to represent persons submitting questions. If you have a specific legal problem, please consult with a qualified lawyer in your area.

Question: If I buy a copy-protected program, is it OK for me to copy it with a copying program in case the original is damaged?

Answer: Making a copy of a computer program for archival purposes does not infringe the author's copyright for the program. Permission to make such copies is given explicitly by Sec. 117 of the Copyright Act (17 U.S.C. Sec. 117). However, there are significant limitations and conditions on this permission. In particular, the statute provides that it is not an infringement for you to make or to authorize the making of another copy or adaptation of the program only if 1) you own the copy from which the new copy is made; 2) the new copy or adaptation is for archival purposes only; and 3) all archival copies are destroyed in the event that you no longer rightfully own the first copy from which the archival copy was made.

Be sure to note, too, that copyright law may not be the only legal barrier to making back-up copies. Vendors of computer software do not usually sell their programs outright. Typically, software publishers sell only a license to use the program. That is, the purchaser, who may be called the "licensee" in an agreement, buys only a right to use the program rather than any ownership interest in the program itself. Some licenses even provide that the physical disk on which the user's copy is distributed remains the property of the seller.

Many licenses restrict the right of the buyer-user, among other things, to make copies. If you have a license agreement or other contract from a software supplier, read the terms of the contract before making any copies. (In fact, it is a good idea to read the contract before buying the program.) Therefore, although making an archival copy of a program may not violate the Copyright Act, the making of the copy may still be prohibited by your agreement with the vendor of the program.

Question: I'm a teacher and I've been working on a program that I'd now like to market. My principal says the school district has a right to the royalties from the program. Is this true?

Answer: Maybe. The answer depends on a number of factors, including the nature of the program, your duties as an employee of the school or school district, the use of the program, and how, when and where you wrote the program. The general rule is that the copyright in a program belongs to the "author" of the program. Unfortunately, it is sometimes difficult to determine who is the "author" for the purposes of the Copyright Act. Just because you are employed by someone else does not mean that the other person owns the rights to the program you wrote. However, your employer is automatically considered to be the author of the program if the program was written "for hire." A program is written for hire if 1) you are employed and 2) the program was written within the scope of your employment. In simpler terms, the program belongs to your employer if you wrote the program as part of your job. (A work is also deemed made "for hire" under other circumstances, particularly where the program's creator is not an employee and he or she writes the program in response to a special order or commission. These provisions are found at 17 U.S.C. Sec. 101.)

Therefore, in determining whether the program was written in the course of your employment, you and your employer should assess the following factors:

1) Did your employer have the right to tell you to work (and how to work) on the program?
2) Were you being paid by the school for the hours you actually spend developing the program?
3) What use, if any, did you make of the school's facilities in developing the program?

Note, though, that writings by government employees relating to their employment, written mostly during off-duty hours, are not government property. In an older case, it was held that a teacher's

printed materials are well known and generally respected. The law concerning networking or booting a disk in eight different machines is not as clear. If the original copy of a disk is ruined, can we make a backup copy of the backup copy?**

All of these issues relate to how we view a software policy. Coordinators were unsure on how to act or react to these problems.

From my survey, I was not able to identify a sound software protection policy. Most schools and school districts felt that a strengthening of their policy was necessary, but did not know exactly how to proceed.

Software protection is a major concern of all educators, and even though I have not presented the guide I had intended, perhaps this article will generate some response. If you have questions, please ask them. If you have a workable plan or ideas for such a plan, share them! This is your newsletter—other coordinators want to hear what you have to say.

[Bernie Nelsen is a graduate student in computer education at the University of Oregon. He has taught secondary math for fourteen years in Iran and Thailand as well as in the United States.]

*The ICCE Policy Statement is in the September 1983 issue of *The Computing Teacher* and is also available on request. Please send a self-addressed stamped envelope to ICCE, Software Policy Statement, University of Oregon, 1787 Agate St., Eugene, OR 97403. Permission is granted by ICCE to make copies of the policy statement.

**For answers to some questions on copyright and software, see David Novick's article in this issue, page 5.

Software Protection Policies

[The following policy statement was provided by Julie Willey, Program Director for Community Youth Creative Learning Experience (C.Y.C.L.E.) in response to Bernard Nelsen's article, "Software Protection Policy—What Is It?" in the introductory issue of the SIG Bulletin.*]*

POLICY STATEMENT on MICRO ETHICS

1. Ethical, as well as practical problems caused by software piracy will be taught.
2. No illegal copies of copyrighted programs will be made or used on C.Y.C.L.E. equipment.
3. Legal copies of copyrighted programs will be protected to prevent unauthorized additional copies.
4. C.Y.C.L.E. stands behind the authors, companies and professional community in upholding the copyright laws for software.
5. C.Y.C.L.E. will accept no copies of software that are *knowingly* illegal, regardless if they are donated or obtained in some other way.
6. The legal or insurance protection of C.Y.C.L.E. will not be extended to staff, students and others who violate copyright laws.
7. It is the intent of C.Y.C.L.E. to adhere to the provisions of copyright laws in the area of microcomputer software. This means compliance of Public Law 96-517, Section 7(b) which amends Section 117 of Title 17 of the United States Code to allow for the making of a back-up copy of computer programs. This states that "... it is *not* an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
   a. that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and it is no other manner, or
   b. that such a new copy and adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful."

Computers, Software and the Law

by
DAVID G. NOVICK

[The answers given in this column are a discussion of general principles of American law, and are intended to provide background information for people who work with computers and software. The author neither purports nor undertakes to represent persons submitting questions. If you have a specific legal problem, please consult with a qualified lawyer in your area.]

Question: What is the current status of laws regarding the copying (pirating) of software that has a copyright? I have heard that it is legal to make back-up copies. I have also heard that the whole question of copyright for software is legally "up in the air."

Answer: The law of copyright for software is now much clearer than it was before 1976. For the first time, programs, even in machine-readable form, are copyrightable. (Actually, the law now considers computer programs "non-dramatic literary works," so hackers are now in the company, legally speaking, of Twain, Proust, and Kerouac.) It is permissible to make back-up copies, as discussed above. Therefore, copying and pirating are not synonymous. Pirating is the making, and sometimes distributing or selling, of illegally-made copies. Pirating of programs is infringement of copyright, and makes the pirate both civilly and criminally liable under copyright laws. Other sanctions for pirating, including prosecution for theft and civil actions for damages under state law, are also possible.

Question: A team of teachers in our school district is working on a set of programs which may have commercial value. The project will probably take

over a year to finish. We have a number of questions relating to the project. First, can we copyright the programs before they are completed? Should we copyright both the documentation for the project and the programs themselves? What kind of protection will a copyright give us? Finally, would you outline the general steps involved in obtaining a copyright?

Answer: Under the copyright laws of the United States, a computer program (or any other work, for that matter) can be copyrighted as soon as it is in a "fixed" form. This means that a program can be copyrighted when it is written or typed on paper, stored on disk or tape, or otherwise stored in a manner in which the program may be read by a person or a machine. The authors' expectations that the program will later be revised or expanded does not affect the copyrightability of the program. Rather, the authors can subsequently copyright the changes and additions as they are made. Therefore, you will probably want to obtain copyright protection for the program as soon as you create it. Note that the length of protection for programs which are jointly created is the life of the longest-surviving author plus fifty years. However, where the program is written by employees for the benefit of their school district as part of their jobs, the program is considered a work written "for hire," so the term of protection is 100 years from the date of creation of the program, or 75 years from the date of publication of the program, whichever is shorter.

Both the program and the documentation should be copyrighted! Failure to obtain adequate copyright protection for either the program or the documentation may result in losing all or some rights in the work. This means that you should put appropriate copyright notices in both the documentation and the program itself, and should comply with the registration and deposit requirements for both.

A copyright is just that: the exclusive right to make copies of a computer program or other work. The copyright act provides that the owner of a copyright has the exclusive rights to do and to authorize any of the following things:

1) To reproduce the program in copies;
2) To prepare the derivative works based upon the program;
3) To distribute copies of the program to the public by sale or other transfer of ownership, or by rental, lease or lending.

There are also some other rights which mainly involve non-computer works, such as plays and movies.

You should be aware that some aspects of protection depend on timely compliance with the registration and deposit requirements. The most significant aspect, especially for smaller businesses, is the right to collect your attorney fees from the infringer if you win an infringement claim. Therefore, register your program within three months of publication of the program. There are special rules dealing with how many and what kinds of copies of the program have to be sent in with the registration. Generally, you should deposit one copy of the first and last 25 pages of your program listing, and two good copies of the documentation. You can and should consult a recent book on computer copyrights for details; if the project is complicated or especially important, consult an attorney.

You still have these rights for the length of the applicable copyright term. As a consequence, you will have a right to collect damages for infringement from other persons who make copies of your program, whether they sell them or not. There are, of course, some exceptions to this rule; these are mainly aspects of "fair use," and are rather fluid and technical. With respect to computer programs in particular, the owner of a copy of the program may make archival copies, and can make "copies" of the program in computer memory which may be necessary in order to run the program. If you need more information about this aspect of copyright protection, I suggest that you consult an attorney with knowledge in the field.

The mechanics of obtaining a United States copyright are relatively simple. Make sure that the copyright notice "Copyright 1984 Your Name Here" is at the beginning, title page (if any), and end of the program listing, that the program displays the copyright notice either when it starts or throughout the program, and that the packaging of the disk or cassette also displays the copyright notice. Actually, any of the methods alone is sufficient under the Copyright Act, but I suggest that you use all of them in order to make absolutely sure that the notice is valid and that users understand clearly that the program is copyrighted. To register the program, obtain Form TX from the United States Copyright Office, Library of Congress, Washington, D.C. 20559; fill out the form as directed, and return it along with a check or money order for $10 and the requisite number of copies.

Question: A group of my students has studied the ideas and coding of a gradebook program. They like the general format and style of the program, but believe that they could make it significantly easier to enter data and also speed up its routines significantly. If my students rewrite the program and improve its performance substantially while keeping the general ideas, can they copyright it?

Answer: I see two potential problems here. The first is whether the author of the original gradebook program has rights which would limit the protection available to your students. The second is whether the student's program has any aspects which are copyrightable in themselves.

In looking at the rights of the original author, you might start by checking if the gradebook program

was copyrighted. If not, the program is likely to be in the public domain, and so use of the program by your students would most probably not be an infringement. If the program were copyrighted, however, your students can still use the ideas embodied in the program, if not parts of the actual program. Perhaps the most significant limitation on copyright protection is that copyright protects only the expression of an idea and not the idea itself. (In contrast, patents protect the inventor's method itself, and not just how the method is written down.) The Copyright Act provides that, "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." This means that the students can use the system which the program implements if they write their own routines to do them.

The second aspect is a sort of mirror image of the first. Note that the students will only have rights in the code they write, and will not have rights to any method of keeping gradebooks. Moreover, if the original program turns out to have been in the public domain, the students' copyright will cover only the changes they made and will not protect parts of the old program incorporated into the new program.

[Attorney David G. Novick welcomes your questions regarding legal problems with software under the laws of the United States. Readers' questions will be answered, space permitting. If you have a question about copyright or related topics, please send it to "Computers, Software and the Law," c/o ICCE SIGCC, University of Oregon, 1787 Agate St., Eugene, OR 97403, USA.]

[Attorney David G. Novick earned his J.D. degree from Harvard Law School in 1977. He is a member of the bar of the District of Columbia, the Oregon State Bar, the Federal Communications Bar Association and the American Bar Association. In addition to his private practice, Mr. Novick has taught at the University of Oregon School of Law since 1981, where he is Adjunct Assistant Professor of Law. Mr. Novick is a founder and the managing partner of McKenzie InterMedia Group, a consulting firm emphasizing the relationship between technology and marketing. Mr. Novick is also in the Ph.D. program in Computer and Information Science at the University of Oregon.]

Right and Wrong in Educational Computing

by
DAVID G. NOVICK

[A preliminary version of this article appears in the proceedings of the "Computer Extension of the Human Mind" conference held in Eugene, Oregon in August 1984.]

What is wrong with copying other persons' programs if they won't be hurt? Teachers who use computers routinely face this and similar questions, but lack a systematic way to find answers. Some writers have proposed a professional code of ethics for computer science. However, for the reasons discussed below, codification of ethics may not be the best approach. Perhaps something like an informal etiquette would be appropriate. Given the nature of the field, the origins of our ideas about ethics, and the novelty of the questions we face, any approach to ethics in computer science should be developed on an evolving, case-by-case basis. Indeed, we should encourage students to participate in the development of such a system; in this way students may regard adherence to notions of right and wrong in computer science as a shared responsibility rather than an arbitrary and authoritarian burden.

For purposes of analysis, I propose to distinguish between *morality* as a measure of absolute goodness in some natural sense and *ethics* as a system or collection of precepts based on morality. In other words, *morality* is our knowledge of what is good, and *ethics* are systematic ways of resolving conflicts between competing goods. Given even this general framework, it would seem to be hard to construct a morality of computer science, let alone a system of ethics based on such a morality. There are, however, certain things upon which we can probably agree: it is wrong to injure someone; curiosity is good; putting knowledge to work is good; and so forth. One might object that "curiosity is good" (or any of the other tenets above) is not always true. This objection, I believe, is ill-founded because it confuses morals and ethics. That is, situations where one might like to inhibit curiosity arise not because the curiosity is itself bad but because some other moral value, perhaps privacy, seems more important under the circumstances. Given a set of agreed upon moral values (or, to put it another way, goals), we are faced with the problem of resolving situations where moral values conflict. This is what I have been referring to as *ethics*.

Using this definition, there are obviously a large number of ethical decisions to be made in computer science and computer education, but it is not obvious that any of these decisions are difficult ones. In medicine, by way of contrast, there are clearly difficult ethical decisions; for example, our moral sense that life should be preserved conflicts with our sense that persons should be spared misery when facing the plight of a terminally ill person in much pain whose life is being sustained through "heroic" efforts. Similarly difficult questions exist in other professions such as law. In the sciences and in scientific education, there has been little clamor for guidance on questions of similar difficulty. A survey of formal ethics in the sciences conducted in 1981 found that the few ethical codes which did exist were typically promulgated by engineering societies, that the codes had a fair amount of formality, and that there was neither widespread dissemination or acceptance in the scientific community. My own review of proposed codes of ethics in computer science suggests that such codes are chiefly concerned with upholding the dignified image of the profession which computer programmers aspire to create.

There are, nevertheless, some interesting issues resulting from moral conflict in the use of computers. Conflicts between the value of utility versus the value of an orderly society arise in the case of theft of software, copyright violations, and invasion of privacy. The value of curiosity is clearly at odds with the value of privacy in many situations, including the creation and use of large data bases. In some of these cases there are laws which provide relatively clear guides for behavior independent of ethical considerations. In other situations, the law is obscure or non-existent.

I propose, then, to look at the interaction of ethics and law in three specific situations which I believe are commonly encountered by computer educators. In one instance, there are relatively clear markers for acceptable conduct. In the other two, the situation is so new and undeveloped that we cannot get much farther in our analysis than simply asking the right questions; the answers will have to come from our collective experiences and responses as we face these issues in the concrete rather than in the abstract.

Illicit Copying and Use of Software

Trade secret protection, a creation of state common law, has been frequently cited as the best method for protection of the ownership interest in

computer software. Aside from the problems which otherwise limit the effectiveness and scope of this doctrine, it seems totally inapplicable to the use of software in education. That is, educational use is, virtually by definition, the sort of public use or distribution which renders trade secret protection impotent. As a result, most educators encounter the problem of illicit copying and use of software in the context of the federal copyright laws. The present law, the Copyright Act of 1976 (as amended), is encoded as 17 USCA. Under the copyright law, a computer program (or any other work, for that matter) can be copyrighted as soon as it is in a "fixed" form. This means that a program can be copyrighted when it is written or typed on paper, stored on disk or tape, or otherwise stored in a manner in which the program may be read by a person or a machine. The authors' expectations that the program will later be revised or expanded does not affect the copyrightability of the program. Rather, the authors can subsequently copyright the changes and additions as they are made. Thus, if as an educator you are writing a computer program, you will probably want to obtain copyright protection for the program as soon as you create it. Note that the length of protection for programs which are jointly created is the life of the longest-surviving author plus fifty years. However, where you are an educator or a student who wishes to use a program, your interest is in wide use of a work rather than its protection. The copyright laws provide a relatively mechanical solution to this problem; the competing values of encouraging new works and fostering widespread use have been resolved without requiring educators to make ethical choices. The reality, though, is that the ethical values of these solutions have to be communicated to students; respect for federal law may not be enough, particularly when the institution or some of its employees violate the copyright law as a matter of routine.

Legally speaking, a copyright is just that: the exclusive right to make copies of a computer program or other work. The copyright act provides that the owner of a copyright has the exclusive rights to do and to authorize any of the following things:

- To reproduce the program in copies;
- To prepare derivative works based upon the program;
- To distribute copies of the program to the public by sale or other transfer of ownership, or by rental, lease, or lending.

There are also some other rights which mainly involve non-computer works, such as plays and movies. That these rights may also have a basis in the extra-legal societal norms upon which the law is based, then, constitutes the ethical aspect of illicit copying and use.

Unauthorized "System Hacking"

Similarly, there may be few laws regarding the consequences of unauthorized access to a computer system, but we have, I suggest, a common fund of understanding that this is something wrong. The hacker may get some educational value out of this activity, but the wrong created thereby is usually deemed greater than the good. Should this decision be left to the individual, or should a generally accepted sense of the bounds of such activity be organized?

Collection, Use and Maintenance of Information

The creation of data bases large and small, in schools, business, and government, have given rise to articulated fears that misuse of these data bases might infringe on privacy interests. Invasion of privacy is, in this country, overwhelmingly a matter of state common law. The rules thus vary enormously by state; indeed, the right itself was not even recognized until the turn of the century. In the case of data bases, the common law has yet to catch up to our technology. Should the moral values of (non-legal) privacy outweigh the utility of the use of information, in the absence of a rule of law?

A recent book on the growing field of computer law provides information on some of the formal responses which society has made to these problems: Mandell, Steven L. *Computers, Data Processing and the Law,* West Publishing Co. (St. Paul, Minnesota: 1984).

Software Copyright Interpretation

by
LeRoy Finkel

I have been asked to reconvene the ICCE Software Policy Committee so that we may examine the current state of the art (things in law tend to change over time) and review our current policies. As we prepare to meet, it seems appropriate to share with *The Computing Teacher* readers the best information we have regarding current interpretation of copyright laws.

There are no definitive answers to most of the questions we have, since the copyright law is vague in places and there have been no court cases to set precedent. Nevertheless, copyright attorneys, court watchers and lawmakers all seem to agree on how a court would interpret the current law if and when a case came before it. Not wanting to get sued and wanting to encourage software development by vendors, I prefer to take a conservative approach that looks to how the law will *likely* be interpreted, rather than waiting for the definitive decision by a court. In other words, I don't want to be the test case!! Do *you*? For those who doubt that publishers will sue a school district or teacher, be reminded that the American Association of Publishers did sue New York University, that a BOCES in New York was also sued (both public agencies lost their cases), and that while publishers may not sue, their professional associations seem willing and able to do so.

The issues:

1. **Back-up copies.** You are allowed back-up copies (number uncertain) that are to be used for archival purposes in the event your original copy fails. Such copies are ***not*** to be used on a second machine at the same time as the original. Since a backup is allowed by law, and if your vendor does not provide one or allow a process by which you can acquire one, then you may make one. But its ***use*** is restricted as stated above. Vendors who offer "multiple" back-up copies are using the term "back-up" incorrectly and have been asked to use the term "multi-copy discounts," which more accurately reflects what they are offering you.
2. **Multiple-loading or booting from one disk into multiple machines at the same time.** "In the absence of a license that explicitly permits you to do so," you would likely be in violation of the copyright laws if you loaded multiple computers with the contents from one disk for use at the same time. The legal concept has to do with the "proliferation of simultaneous users." The law is designed to protect the copyright holder from loss of sales. If *Bank Street Writer* is sold for use on one machine (and it is), and you load it into 15 machines, one after the other, so that all 15 are in use at the same time, you are inhibiting sales. Thus, you are in violation of the law. The fact that you *can* physically load the contents into multiple machines is irrelevant. The law does imply that sequential use on different machines is okay (first on one machine, turn it off, then on another machine). The key element here is proliferation of "simultaneous" users. That one concept has helped me out a lot. Two companies have recently announced simultaneous-use or multiple-loading software. They have been asked to emphasize that this is a special license for a particular piece of software. One solution to the multiple-loading "problem" is multi-copy pricing and licensing, an option more companies seem to be taking.
3. **Networks.** "In the absence of a network license" you would likely be in violation of copyright laws if you downloaded a program to multiple stations at the same time from your network, be it a hard disk or floppy disk network. The "proliferation of simultaneous users" concept described above would again apply. ***Whether it is physically possible to load the stations from the network is not germaine to this discussion. The absence of a license permitting simultaneous use is the copyright issue.***

It is not enough for districts to merely pass copyright policies—we must pay heed to them. It is the responsibility of each of us to be a role model to fellow teachers and students alike and allow only legal uses of software on our campuses.

If you have questions, comments or information for the committee, please write me. Since the law is somewhat different in each country, I would like to hear from people willing to serve on subcommittees for specific countries.

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